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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/863,162	05/23/2001	Shlomi Arnon	C1113-7010	8807

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EXAMINER

SHARMA, SUJATHA R

ART UNIT PAPER NUMBER

2684

DATE MAILED: 06/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/863,162	ARNON ET AL.	
	Examiner	Art Unit	
	Sujatha Sharma	2684	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-20 and 22-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,8-20 and 22-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-4,8-18,22-33,35 are rejected under 35 U.S.C. 102(b) as being unpatentable over Fischer [US 5,852,651] in view of Koonen [US 6,674,966].

Regarding claims 1,15,29,31 Fischer discloses a communication system with remote unit having microcell antenna units. Fischer further discloses a base station transceiver system (BTS) positioned at a first location (see col. 3, line 45 – col. 4, line 20 and Fig. 2) that receives a composite downlink signal containing information for a plurality of mobile stations and transmits a composite uplink information signal containing information from a plurality of mobile transceivers (see col. 33, lines 29-49) and further comprising:

- Communication control circuitry, adapted to generate downlink radio frequency (RF) signals receivable by a mobile transceiver device operative within the cellular network and to process uplink RF signals transmitted by the mobile transceiver (see summary of invention, Figs. 3,4, col. 10, lines 17-31);

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- First transducer circuitry, adapted to modulate a first beam of unguided electromagnetic (EM) radiation with the downlink RF signals and to radiate the modulated beam as a first modulated beam, and to receive and demodulate a second modulated beam of unguided EM radiation so as to recover the uplink RF signals (see summary of invention, Fig. 4, col. 10, line 17- col. 11, line 15);

Fischer further discloses an antenna assembly, positioned at a second location remote from the first location (See Fig.2, and col. 3, line 45 – col. 4, line 20) comprising of:

- A second transducer circuitry, adapted to modulate a second beam of unguided EM radiation with the uplink RF signals and to radiate the modulated beam as second modulated beam to BTS, and to receive and demodulate the first modulated beam of unguided EM radiation from the BTS so as to recover the downlink RF signals (see summary of invention, Fig. 8, and col. 13, lines 1-67).
- An antenna adapted to radiate the recovered downlink RF signals to the mobile transceiver and to receive the uplink RF signals from the mobile transceiver (see summary of invention, Fig. 8, and col. 13, lines 1-67).

However Fischer does not disclose a method wherein transmitting and providing the first signal includes transmitting an optical signal via a wireless optical link between the first infrastructure and the first remote antenna.

Koonen, in the same field of endeavor, teaches a method of transmitting and providing the first signal includes transmitting an optical signal via a wireless optical link between the base station and the remote antenna. See summary of invention, col. 5, lines 15-20.

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Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to provide the above teaching of Koonen in Fischer's invention in order to reduce the cable loss and improve the performance and also to provide more flexibility in placing the antenna for example in a low cost location.

Regarding claims 2-4,16-18, Fischer further discloses the first and second transducer circuitry adapted to radiate the first and second modulated beam via a path between the BTS and the antenna comprising of free space. See col. 3, line 45 – col. 4, line 28, col. 10, lines 33-53, col. 11, lines 6-15.

Regarding claims 8, 22, Fischer further discloses the system to comprise of a switching center (see MTSO in Fig. 2 and col. 10, lines 7-23), which is adapted to generate the information responsive to the uplink and downlink signals and to transfer the information between the BTS and cellular network.

Regarding claims 9,23, Fischer discloses a base station controller, which controls the BTS (see Fig. 1B, 3, col. 1, lines 60-63, col. 10, lines 17-21).

Regarding claims 10,24, Fischer further discloses where one of the downlink RF signals and uplink RF signals comprise a plurality of separate RF signals. (See col. 3, lines 45-60, col. 4, lines 43-49).

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Regarding claims 11-14,25-28, Fischer further discloses the first and second transducer circuitry comprises of analog-to-digital converters and digital-to-analog converters and to further compress and de-compress digitized signals. See Figs. 4, 8, col. 10, line 33 – col. 11, line 25, col. 13, lines 1-35.

Regarding claims 30,32, Fischer further discloses a method providing one BTS per antenna assembly (see Fig. 2, where each BTS 106 is provided with a remote antenna system 102).

Regarding claim 33,35, Fischer further discloses a method to radiate the composite downlink RF signals to the mobile transceivers and to receive the composite up-link RF signals from the mobile cellular transceivers with a coverage area of the BTS. See col. 33, lines 29-49

2. Claims 5,19, 34 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer [US 5,852,651] and Koonen [US 6,674,966] in view of Westbrook [US 2004/0179852].

Regarding claims 5 and 19, Fischer as treated in claims 1 and 15 does not disclose the wavelength of the EM waves.

However Fischer and Koonen do not disclose a specific range of distance between the base station and the remote antenna location.

Westbrook, in the same field of endeavor, teaches a method where the optical link between the central location and antenna remote sites is 30 m.

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Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to operate the system in the prescribed distance range for optimal performance of the system.

Regarding claims 34 and 36, Westbrook further discloses a method where the optical link i.e. distance between the central location and remote antenna site of even 30km is possible thus indicating the positioning of the antenna assembly outside the coverage area of the BTS.

3. Claims 6 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer [US 5,852,651] and Koonen [US 6,674,966] in view of Zhou [US 6,188,808].

Regarding claims 6 and 20, Fischer as treated in claims 1 and 15 does not disclose the wavelength of the EM waves.

However it is well known in the art to operate the EM in the range specified in claims 6 and 20 as taught by Zhou (see col. 7, lines 33-34 where the operating wavelength of the EM wave is 1.55 μm).

Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to operate the system in the prescribed frequency range for optimal performance of the system.

Response to Arguments

4. Applicant's arguments regarding the newly added limitation to the independent claims 1, 15 are met by the Fischer reference as discussed in the rejection of the claims 1,15 above.

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Further the applicant argues that the Koonen reference does not disclose a method of transmitting wireless optical signals between the base station and a remote antenna. However, the examiner respectfully disagrees and draws the applicant's attention to Koonen's reference wherein Koonen discloses in col. 6, lines 5-19 and Fig. 4 that the BSC/BTS are collocated and shows the unguided optical beam between the BSC/BTS (14,16,32a IN Fig. 4) and the antenna (36a - 36n).

Applicant's arguments with respect to claims 5,6,19,20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Buoli [EP 1 443 687 A1] Improved VCSEL analog optical link

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sujatha Sharma whose telephone number is 571-272-7886. The examiner can normally be reached on Mon-Fri 7.30am - 4.00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung can be reached on 571-272-7882. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Sujatha Sharma
5/31/05

EDAN ORGAD
PATENT EXAMINER/TELECOMM.

4.0. 6/1/05